

Ice Seasonality Investigation

Site Definition Field Guide

Task

To set-up, draw, describe, take photographs and locate the latitude, longitude and elevation of your Ice Seasonality site.

What You Need

- ☐ GPS receiver
- ☐ *Basic GPS Field Guide*
- ☐ *GPS Data Sheet*
- ☐ Topographic map of the area
- ☐ Air photo or satellite image of the area (optional)
- ☐ *Ice Seasonality Investigation Site Definition Sheet*
- ☐ Surveyor's stakes and/or tape
- ☐ Pencil or Pen
- ☐ Digital camera (with extra batteries)

In the Classroom

1. Determine the source of the meteorological data (air temperature and snow events) you will use for the Ice Seasonality Investigation. Please keep in mind that none of these data sources give you an exact description of the daily air temperatures and snow events since none of them are located on the Ice Seasonality study site.

Meteorological data sources include:

a. A school sponsored, site specific, GLOBE weather station at a GLOBE Atmosphere site (located not more than 100 meters from your Ice Phenology site - see the GLOBE Teacher's Guide – Atmosphere Chapter). It is recommended that the GLOBE Maximum, Minimum and Current Temperature Protocol be implemented. You will have to compile these data on a daily basis in order to create a useful data set. This data source will produce the most relevant meteorological data for your Ice Seasonality study site because they are acquired closest to your site although there may be a difference in elevation. This difference in elevation may result in a slight difference in the daily minimum temperature as cold air pools in low-lying areas at night.

b. The government operated weather station in your local area or region. The monthly summaries of these data may not be available for several months after the fact. However, the relevant agency may have a web site or other data distribution venue where daily data are available. You will have to compile these data on a daily basis in order to create a useful data set. These data may only give a general idea of the temperature conditions at your Ice Seasonality study site, since the source is not at the same location as your site and may be in a different environment or at a different elevation.

c. The local airstrip weather data. This may be available on the Weather Underground web site at <http://www.wunderground.com/>. To determine the data sources near the observation site:

- Enter the appropriate information in the search cell at the top of the web page.
- Scroll down to the “Nearby Airports” area (highlighted in light blue) and select the correct location (the window will refresh itself if you choose another location from the current window).
- Scroll down to the “History & Almanac” area (highlighted in light blue) and in the “Detailed History and Climate” section click on the “Calendar View”. This will take you to a summary of the current month’s data.
- Scroll down to the bottom of the page where the data are tabulated. Either read the information needed directly off the web page or download the data as a Comma Delimited File.

You will have to compile these data on a daily basis in order to create a useful data set. These data may only give a general idea of the temperature conditions at your Ice Seasonality study site, since the source is not at the same location as your site and may be in a different environment or at a different elevation.

d. The local television and radio broadcasters and newspaper. These information outlets report the daily meteorological data (the daily maximum, minimum, and mean daily temperatures and amount of precipitation). It is a good idea to contact these information outlets to find out what the sources of their data are. You will have to compile these data on a daily basis in order to create a useful data set. These data may only give a general idea of the temperature conditions at your Ice Seasonality study site, since the source is not at the same location as your site and may be in a different environment or at a different elevation.

2. Fill out as much of the “Source of Meteorological Data” section. If you are **NOT** using a GLOBE Atmosphere Site, you should be able to complete this section before going in the field.
3. Locate the map or image (airphoto (<http://terraserver-usa.com/> - USA sites) or satellite image from Google Earth) that will describe the general area of your site and make or print out a copy to take in the field.

In the Field

4. Fill out the top part of the Site Definition Sheet (lines 1-5).
5. Identify and set up the Ice Seasonality site as described in the Ice Seasonality Protocol – Site Set Up. Remember to identify the vantage points (positions

from which the photos are taken) and the targets. It is highly recommended that the vantage points be marked with a surveyor's stake or tape.

6. Identify the latitude, longitude and elevation of the observation site following the *Basic GPS Measurement Protocol* **OR** use a topographic map to determine this information.
7. If you have a GLOBE Atmosphere siteweather station adjacent to your Ice Seasonality observation site then: record its name (ATM-99) and measure:
 - Its name (ATM-XXX)
 - Distance to Atmosphere site from Ice Seasonality site
 - Direction to Atmosphere site from Ice Seasonality site
8. Provide an adequate description of how to get to the site. This should include the best route to drive from a well-known landmark (the school, major cross roads) to the parking area. Then describe the walking route from the parking site to the spot where the Standard Photograph Set is acquired.
9. Determine the **biome** of the site:
 - a. Determine the NATURAL biome of the site. This is what the site would be classified as if there were no human activity in the area. You may need to make some notes on the general vegetation and then go to the GLOBE Seasons and Biomes website for descriptions and pictures of the major biomes once you return to the classroom.
 - b. Describe what kind of human modification has occurred at the site (urban, suburban, rural, industrial, agricultural or no alteration).
10. Document the general configuration of the study site using a sketch, map or image. Annotate your sketch, map or image, labeling important natural and cultural landmarks. Provide a north arrow and scale (if possible).
11. Describe the water body to be studied (i.e., estimated length, width and depth of lake, estimated depth and width of river, velocity of river water at the observation site (slow to fast, including rapids), general topography, dominant vegetation, etc.
12. Take a standard set of photographs. These “views” will be used for the entire freeze-up and break-up of the water body. It is best to select targets that are either at the center of the image (horizontal or vertical) or that define the edges of the image.

Photographs will be stored in the database at a size of not more than 1000 pixels wide, so they should be taken at the closest resolution of your camera to this size. (Always choose the slightly larger image if a 1000 pixel wide image is not one of the camera's standard options.) These images should all

be taken on the same photo setting (i.e., the default setting, NOT Zoom) in landscape format.

A River Ice Standard Photograph Set includes three photos: Across, Upstream, and Downstream.

A Lake/Pond Ice Standard Photograph Set includes as many photographs as necessary to fully document the site. (It is best not to exceed 6 images – this ensures repeatability and data acquisition in a timely fashion.

13. Use the comment space for each photograph to describe the landmarks that define the image (objects that appear at the edges or at specific places within the image). Also describe the exact relationship between the stake marking the vantage point and the photographer when the photo is taken (stand in front, behind, to the left, etc.).

In the Classroom

14. Confirm your biome selection by going to the GLOBE Seasons and Biomes website.
15. Download your images and rename them according to the following convention: **ICE-99_YYMMDD_XXXXXX** where:

ICE-99	is the site ID created by the GLOBE database when you create your site. (For your site definition photos, you can use the ID ICE-01 in your photo names and if a different ID ends up being used, your photos will be automatically renamed with the correct ID.)
YYMMDD	is the date of data acquisition
XXXXXX	is the photo view (i.e., <i>Up</i> , <i>Down</i> , or <i>Across</i> for River Ice sites; or the names you selected for Lake/Pond Ice sites)

For example: ICE-01_091028_Down is an image acquired at the first ICE site on 28 October 2008 looking downstream.
16. Put the annotated sketch, map or image of the Ice Seasonality observation site on the computer. This can be done by scanning or photographing the document. In the case of digital images (air photos or satellite images), the field annotations can be transferred to the image in a computer application such as Photoshop and saved as a jpeg file.
17. Complete the *Ice Seasonality Investigation Site Definition Sheet* and submit all of your data to GLOBE.

18. Print out, name and annotate the standard photo set on a single sheet of paper. Important targets in the images should be marked either digitally in a computer drawing application (such as Photoshop) or by hand on the printout.
19. Place this annotated data sheet in a plastic sleeve and take it out into the field on every subsequent visit to the observation site. Use it as a guide to take all of the freeze-up and break-up observation images.

Ice Seasonality Investigation

Site Definition Sheet - *Example*

School Name: **Tri-Valley School**Observer Names: **M. Martin and his class**Date: **7 October 2007**Check one: ☒ New Site ☐ Metadata UpdateStudy Site name (give your site a unique name): **Nenana River at the power plant at Healy**Type of Site: Check one: ☒ River/Creek ☐ Lake/PondCoordinates: Latitude: **63.85** ☒ N or ☐ S (check one)Longitude: **148.96** ☐ E or ☒ W (check one)Elevation: **393.2** metersSource of Location Data (check one): ☒ GPS ☐ Other

If other, describe: _____

Source of Meteorological Data:Temperature data: ☐ GLOBE Atmospheric Site ☐ National Weather Service☒ Airstrip data ☐ Newspaper/local media reportsSnow data: ☐ GLOBE Atmospheric Site ☐ National Weather Service☐ Airstrip data ☐ Newspaper/local media reports ☒ Observation

If possible, provide some location information about the source of your meteorological data:

Distance to Ice Site: _____ kilometers;

Direction to Ice Site: ☐ N ☐ NE ☐ E ☐ SE ☐ S ☐ SW ☐ W ☐ NW**OR**Latitude: **63.87** ☒ N or ☐ S (check one)Longitude: **148.97** ☐ E or ☒ W (check one)

If a GLOBE Atmosphere Site is being used as the source of meteorological data for your Ice Seasonality Site, please complete the following:

Atmosphere Site: ATM-_____

Distance to Ice Site: _____ meters;

Direction to Ice Site: ☐ N ☐ NE ☐ E ☐ SE ☐ S ☐ SW ☐ W ☐ NW**Driving and/or walking directions:** Provide directions to the site from some well-known landmark (school, cross roads, etc.). If appropriate, include walking directions from where your vehicle is parked to the Ice Site access/photo vantage point(s).**From Tri-Valley School – drive back to the Parks Highway. Turn left onto the highway and drive down to the Healy Spur Road. Turn left onto the Healy Spur Road and drive until you arrive at the bridge that crosses the Nenana River (railway bridge is parallel to the traffic bridge and power plant is directly opposite). Park either at the end of the bridge or on it. NOTE: The name of the airstrip that we get our temperature data from is PAHV (elevation 394.5 m)**

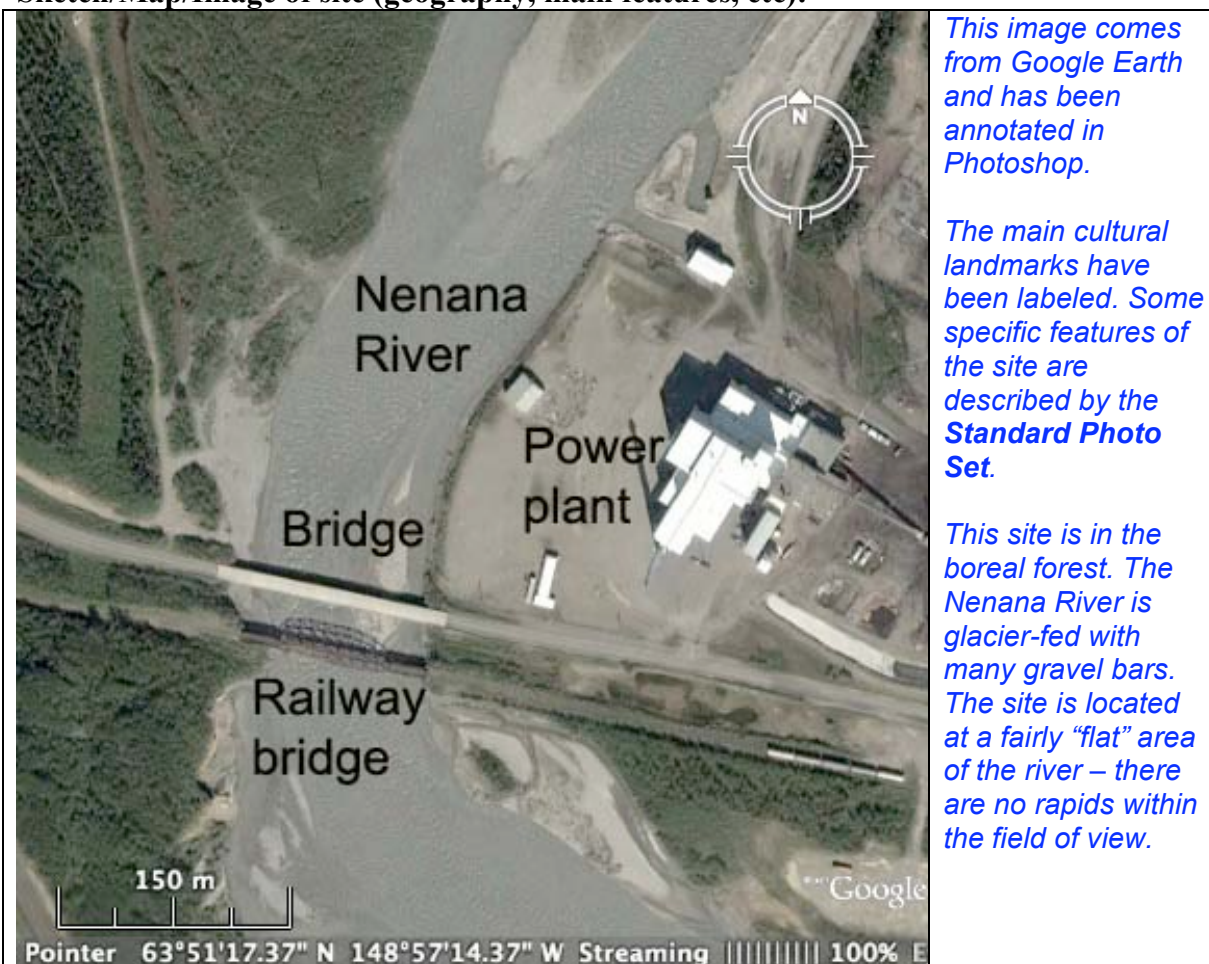
Site Biome:

The site is in the following natural biome (check one – definitions are found on the GLOBE Seasons and Biomes website):

- | | | |
|--|---|---|
| <input type="checkbox"/> Tundra | <input checked="" type="checkbox"/> Taiga/Boreal Forest | <input type="checkbox"/> Montane |
| <input type="checkbox"/> Temperate Conifer Forest | | |
| <input type="checkbox"/> Temperate Deciduous/Mixed Forest | | |
| <input type="checkbox"/> Tropical/Subtropical Moist Deciduous Forest | | |
| <input type="checkbox"/> Tropical/Subtropical Dry Deciduous Forest | | |
| <input type="checkbox"/> Tropical/Subtropical Coniferous Forest | | |
| <input type="checkbox"/> Mediterranean | <input type="checkbox"/> Tropical Grasslands | <input type="checkbox"/> Temperate Grasslands |
| <input type="checkbox"/> Desert/Xeric | <input type="checkbox"/> Flooded Grasslands | <input type="checkbox"/> Mangroves |

The natural condition of the site has been modified by human activity in the following way (check one):

- | | | |
|---|--|-----------------------------------|
| <input type="checkbox"/> Urban (dense settlement) | <input checked="" type="checkbox"/> Rural (villages) | |
| <input type="checkbox"/> Croplands/Agriculture | <input type="checkbox"/> Rangeland/Grazing | <input type="checkbox"/> Forestry |
| <input type="checkbox"/> Little Human Influence | <input type="checkbox"/> No Human Influence | |

Sketch/Map/Image of site (geography, main features, etc):

Standard Photograph Set of River Ice/Lake Ice Observation Site:

For a **River Ice site**, the Standard Photograph Set includes three photos: Across, Upstream, and Downstream.

For a **Lake/Pond Ice site**, the Standard Photograph Set needs to be defined by you and can include up to 6 photos. If this is a **Lake/Pond site**, provide names for the *photo views* in your standard photo set:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

Your Site Definition includes taking one Standard Photograph Set. When you download the photos from your camera, rename them to follow the convention *study site ID_date_photo view* (so the format would be: *ICE-99_YYMMDD_XXXXXX* where *XXXXXX* is *Up, Down, or Across* for *River Ice sites*; or the names you chose above for *Lake/Pond Ice sites*).

Enter the filename and annotation comments for each photo here:

Photo 1: ICE-01_071007_Across



Comments: **The bridge forms the right-hand boundary of the image. The building on the far bank, next to the power plant, appears at the left-hand boundary of the image. The power plant appears in the top third of the image.**

Photo 2: ICE-01_071007_Down



Comments: **The small building appears at the right-hand boundary of the image. The two vertical poles and the peak-like structure appear at the left-hand boundary.**

Photo 3: ICE-01_071007_Up



Comments: **The railroad bridge appears in the top half of the image. Use the bridge structure to locate the image (i.e., the bridge pier appears at the right-hand boundary of the image).**